Notice of Allowability	Application No.	Applicant(s)	
	10/070,558	BJERRUM ET AL.	
	Examiner	Art Unit	
	Angela J. Martin	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *1/10/05*.

2. ☐ The allowed claim(s) is/are *35-70*.

3. ☒ The drawings filed on *08 March 2002* are accepted by the Examiner.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

REASONS FOR ALLOWANCE

1. The following is an examiner's statement of reasons for allowance:

The Applicant claims a method for preparation of a polymer electrolyte membrane for fuel cells, the method comprising: providing an acid-doped solid electrolyte; providing a gas diffusion cathode by providing a first hydrophobic carbon support substrate by treatment of substrate with a hydrophobic polymer solution, providing a first supporting layer on the substrate by casting a slurry onto the substrate, the slurry comprising carbon black and a hydrophobic polymer, providing a first catalyst layer on the first supporting layer by casting a slurry onto the first supporting layer, the slurry comprising carbon-supported noble metal catalysts and a polymer binder, and doping the first catalyst layer with an acid mixture comprising a volatile acid and a non-volatile acid; providing a gas diffusion anode via the steps above, the anode comprising a second hydrophobic carbon support substrate, and a second supporting layer and a second catalyst layer; and assembling the polymer electrolyte membrane by sandwiching the anode, solid electrolyte, and cathode so that the first catalyst layer and the second catalyst layer both are facing the electrolyte.

Applicant claims a polymer electrolyte membrane for fuel cells, the membrane comprising the following successive layers: a first hydrophobic carbon support substrate including a hydrophobic polymer; a first supporting layer comprising carbon black and a hydrophobic polymer; a first catalyst layer comprising a carbon-supported noble metal catalyst and a polymer binder, the first catalyst layer doped with an acid mixture comprising a volatile acid and a non-volatile acid; an acid-doped solid electrolyte; a

second catalyst layer comprising a carbon-supported noble metal catalyst and a polymer binder, the second catalyst layer doped with an acid mixture comprising a volatile acid and a non-volatile acid; a second supporting layer comprising carbon black and a hydrophobic polymer; and a second hydrophobic carbon support substrate including a hydrophobic polymer.

The Applicant claims a method for operating a polymer electrolyte membrane fuel cell capable of operating without removal of carbon monoxide from a fuel gas before the fuel gas is being fed to the fuel cell, the fuel gas comprising a constant or intermittent carbon monoxide content of at least 0.5 vol%, the method comprising the steps of: providing the fuel cell comprising a gas diffusion cathode for reducing an oxygen-containing oxidant gas, a gas diffusion anode for oxidizing a hydrogen-rich fuel gas, and a solid electrolyte the polybenzimidazole, wherein the acid comprising a mixture of a volatile acid and a non-volatile acid, feeding an oxidant gas to the cathode of the fuel cell, and feeding a fuel gas, preferably a hydrogen-rich gas, to the anode of the fuel cell, wherein the temperature of the fuel cell being 25-250 degrees C.

Applicant claims a solid electrolyte for polymer electrolyte membrane fuel cells, the solid electrolyte comprising a blend of a polybenzimidazole and one or more other thermoplastic resins doped with acid.

The prior art of record, either taken alone or in combination, fails to disclose or render obvious a method for preparation of a polymer electrolyte membrane for fuel cells as described above, a polymer electrolyte membrane fuel cell as described above, a method for operating a polymer electrolyte membrane fuel cell as described above

including doping the first catalyst layer and second catalyst layer with an acid mixture comprising a volatile acid and a non-volatile acid. In addition, it does not disclose a solid electrolyte for polymer electrolyte membrane fuel cells, the solid electrolyte comprising a blend of a polybenzimidazole and one or more other thermoplastic resins doped with acid.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela J. Martin whose telephone number is 571-272-1288. The examiner can normally be reached on Monday-Friday from 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJM

PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER